Sta⊜ Form 4336

DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

INDIANAPOLIS

OFFICE MEMORANDUM

DATE:

June 10, 1988

TO:

Northside Landfill, RCRA Ground Water File

THRU:

Karyl K. Schmidt 456-30-88

FROM:

Philip N. Ward PNW 6-17-88

Geology Section

IND 050530872

SUBJECT:

Comprehensive Monitoring Evaluation July 23, 1987, and

Sampling Inspection August 26, 1987

and Related Reviews

Introduction

This memo shall serve as file documentation of a Comprehensive Monitoring Evaluation (CME), and Sampling Inspection conducted on July 23, and August 26, 1987, and related record reviews for Northside Landfill (NSLF). In attendance on July 23, 1987, were Messrs. Eric Riedel and Kurt Maines of the Indiana Department of Environmental Management (IDEM); Mr. Greg Bankert (NSLF); and Mr. Tony Oatess (O. A. Laboratories). In attendance on August 26, 1987, were Messrs. Philip Ward, Eric Henderson and John Buck (IDEM); Greg Bankert (NSLF) and Mr. Tony Oatess (O. A. Laboratories). Many major and minor ground water related violations were noted during this inspection and will be discussed in detail in the Findings portion of this memo.

The scope of this memo shall also document the following: facility background, historical ground water related events, regional geology, site-specific geology and hydrogeologic concerns, ground water (GW) monitoring well system evaluation, findings of violations, and conclusion and recommendation.

Facility Background

NSLF is located in T18N, R2E, Section 2, at 985 South State Road 421, Zionsville, Indiana 46077.

The facility now operates a sanitary landfill. However, they formerly accepted and disposed of hazardous waste in the landfill. The location of the disposed hazardous waste is a matter of dispute; the entire landfill is considered by the State a RCRA waste management facility and is subject to ground water monitoring requirements as specified in 320 IAC 4.1-20-(1 through 5).

The landfill occupies nearly seventy (70) acres of a one hundred sixty-eight (168)-acre parcel of land. The site is bounded on the west by the six and one-half (6.5)-acre site occupied by the former Environmental Conservation and Chemical Corporation (ECC) and physically separated from NSLF by "Unnamed Ditch," on the south and east by Finley Creek, and by several residential homes located about one-half (0.5) miles to the north.

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In 1984, the U.S. Environmental Protection Agency (U.S. EPA) included NSLF on the National Priorities List as an uncontrolled hazardous waste site. National Priorities List sites are eligible for remedial action under the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA). The facility is considered to be a significant non-complier according to RCRA, due to past violations associated with the inadequacy of their ground water monitoring program while it was an interim status facility.

The ground water monitoring system was installed around the landfill in December 1979 and consists of seven (7) monitoring wells. An in-depth discussion of the monitoring system will be discussed later in this memo.

Historical Ground Water Related Events

The source for the following historical information was the January 9, 1987, office memorandum by Ms. Rita R. Boje's discussion and results of ground water and Sampling Inspections conducted at NSLF June 26, 1985 and July 3, 1985:

February 13, 1975--

NSLF began operation as a permitted sanitary landfill.

1977--

Enviro-Chem Corporation (ECC) began operation of treating, storing, recycling, reselling, and disposing of hazardous waste adjacent to the NSLF property.

November 19, 1980--

The U.S. EPA received a Part A application for a hazardous waste permit at NSLF.

June 27, 1981--

ISBH Consent Decree. NSLF took hazardous waste from ECC onto the NSLF property (February 1980-August 1980) and ECC midnight dumping into Finley Creek (August 1979-August 1980).

July 22, 1982--

ISBH suspended action on the review of the NSLF hazardous waste application due to documented ground water contamination in one or more of the wells and required that NSLF implement a ground water assessment program.

August 4, 1982--

An assessment plan was submitted by T. R. West for NSLF with a schedule of implementation.

August 1982--

ECC went into receivership (found to be insolvent).

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October 22, 1982--

January 5, 1983--

January 31, 1983--

May 4, 1983--

May 23, 1983--

May 1983 --

May 19, 1983

T. R. West submitted an assessment report and contended contamination in Well IC was from ECC and not NSLF.

ISBH reviewed T. R. West's assessment report and it was found to be incomplete.

T. R. West responded to the January 5, 1983, ISBH letter--found to still be incomplete.

An NOV and Compliance Order sent to NSLF with violations related mainly to an inadequate assessment program.

Again, T. R. West further responded to the January 5, 1983, letter.

An administrative hearing was held and more ground water quality information was generated. NSLF (since March of 1983) reinstated a detection phase of ground water monitoring around the East Field only of the landfill since they contend that the East Field was the only area that accepted hazardous waste from ECC. The IDEM contends that the whole site needs to be monitored for RCRA and should still be in an assessment phase.

Terry West to Traylor, Land Pollution Control (LPC)--further response to January 5, 1983 letter:

- 1. Table of ground water data
- 2. Ground water flow map-ground water mound at S4.
- 3. Geologic log of MW-1C.
- Cross sections.
- 5. ATEC boring logs.

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June 17, 1983

July 22, 1983

September 28, 1983

October 18, 1983

October 19, 1983

O. A. Laboratory monitoring well No. IC - compares amounts of chlorinated hydrocarbons in MW-IC with an Indianapolis water supply well -- (reported July 20, 1983).

LPC monitoring well sample - collected by Bernaur and Copeland - (reported November 9, 1983).

O. A. Laboratory monitoring well samples --ground water quality--(reported October 6, 1983).

Ball State Study-Less benthic and lower total number of organisms downstream from the Northside Sanitary Landfill (Gary Hook for Dr. H. Siewart).

Operating Permit (No. 6-1) renewal application denied:

- Deviation from approved plan.
 - Failure to pump leachate tanks.
 - b. Plugging southern leachate line.
 - Removal of solid waste from previously filled area.
- 2. Discharge contaminated ground water into unnamed ditch.
- 3. Acceptance of hazardous waste without approval.
- 4. Contamination of ground water near MW-1.

Therefore ordered to close.

West response to NOV allegations.

Freeman Cook commissioned by LPC to prepare an independent engineering report (Environmental Compatibility Review).

November 9, 1983

November 15, 1983

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December 15, 1983

Indianapolis Water Company (December 15, 1983) detected organics in sampling Finley and Eagle Creeks. Chemical Waste Management had small spill (December 7, 1983).

December 16, 1983

LPC ditch and stream samples--collected by Downey (LPC)--(reported January 9, 1984).

December 20, 1983

LPC ditch and stream samples for organics--collected by Downey (LPC)-- (reported January 9, 1984).

January 17, 1984

Letter Lamm (LPC) to Gole (DPW)--informed about results of organic contamination sampling.

February 15, 1984

LPC surface water samples--collected by Shafer and Downey (LPC)--from unnamed ditch, Finley and Eagle Creek-- (reported February 2, 1984).

February 29, 1984

CH₂M water samples from residential wells--accuracy suspect.

March 5, 1984

Letter Doyle (LPC) to Bankert (NSLF)-still questions about:

- Leachate system
- Final elevations
- Closure sequence
- 4. Closure lifetime
- Remedial ground water cleanup.

Cannot act on sludge matter until Closure Decree addresses these problems.

Hunt--"I believe testimony is going to reveal nature and extent of illegal activity at NSLF--entering into a Consent Decree prematurely will only hide these violations."

March 15, 1984

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March 16, 1984

Affidavit by Karyl Schmidt (LPC)--samples from cooling pond, unnamed ditch, and unnamed tributary.

March 21, 1984

CH₂M Hill--surface water and sediment samples.

March 30, 1984

O. A. Laboratory monitoring well samples --indicators of ground water quality--(reported April 27, 1984).

May 7, 1984

Environmental compatibility review final report--Freeman Cook.

May 30, 1984

Zionsville Times article--from hearing --TCE in MW-I should be 1,000 times greater due to calibration error in laboratory.

June 22, 1984

Review of work plan--no geology review.

August, 1984

U.S. EPA superfund program fact sheet.

October 12, 1984

The U.S. EPA denied Part B.

March 6, 1985

NSLF submitted analytical results for monitoring well No. lc. They reported concentrations for the following constituents: benzene at 2.6 ug/l; chloroethane at 177.1 ug/l; and 1,2-t-dichloroethane at less than 7.9 ug/l.

April 16, 1985

NSLF submitted a sampling and analysis plan to Indiana Department of Environmental Management (IDEM).

June 10, 1985

Letter from 0/0 NSLF to IDEM stating that they no longer intend to sample well Nos. 3, 4, 5, and 6 for conventional parameters.

June 21, 1985

Letter from IDEM to 0/0 NSLF concerning the facility's ground water sampling program.

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June 29, 1985

Letter from 0/0 NSLF to IDEM in response to the June 21, 1985, letter. The facility reiterates their contention that well Nos. 1, 2, and 7 are not RCRA ground water monitoring wells.

June 26, 1985

Comprehensive ground water monitoring inspection by Rita Boje.

July 3, 1985

Sampling inpsection by Rita Boie.

January 9, 1987

Discussion of results of ground water and sampling inspection conducted by Rita Boje of IDEM on June 26, 1985, and July 3, 1985, respectively.

February 9, 1987

IDEM requested that NSLF closure/post-closure be pursuant to CERCLA activities.

Regional Geology

The facility is located in the Tipton Till Plain. The surface is a flat to gently rolling area formed on ground moraine glacial till deposited during the Wisconsinan Glacial Advance. Soils are the Miami, Crosby, and Genesee silt loams, according to the Soil Survey of Boone County, Indiana by the U.S.D.A. Soil Conservation Service. The Miami-Crosby Association consists of nearly level to moderately steep soils that formed in glacial till. The Genesee series consists of deep, well-drained, nearly level soils formed on alluvial deposits.

The bedrock beneath the site is the carbonaceous New Albany Shale of Devonian-Mississippian Age, according to the geologic map of the 1° by 2°, Danville Quadrangle, Indiana and Illinois, showing bedrock and unconsolidated deposits. However, the one (1) on-site boring to bedrock indicates the North Vernon Limestone was encountered directly beneath the unconsolidated material. The bedrock dips southwestward into the Illinois basin.

The major regional aquifer in this area consists of glacial outwash sand and gravel lenses within the till. Well screen depths in the vicinity of the landfill range in depth from forty (40) to one hundred ninety (190) feet. Wells in the vicinity of the landfill are used for domestic purposes and pump rates are on average less than ten (10) gallons per minute (GPM) and are not likely to affect flow direction. The regional ground water flow direction is to the southwest toward the confluence of Finley and Eagle Creeks.

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Site Specific Geology

The site's original land surface is a flat to gently rolling till plain sloping toward the confluence of Finley and Eagle Creeks. Pre-landfill elevations ranged from 880 to 940 feet above the National Geodetic Vertical Datum (NGVD).

Original soils prior to landfilling include the Miami-Crosby Soil Association. According to the Soil Survey of Boone County, Indiana by the U.S.D.A. Soil Conservation Service, these are deep, well-drained and somewhat poorly drained, medium textured, and moderately fine textured, nearly level to moderately steep soils formed in glacial till on uplands. The area immediately to the west and south of the landfill is represented by the Genesee Soil Series. This consists of deep well-drained, nearly level soils on bottom lands. These soils formed in loamy sediment deposited by floods.

The Miami Soil Series is characterized by an eight (8)-inch thick grayish-brown silt loam at the surface and a dark to yellowish-brown clay loam subsoil to a depth of thirty-three (33) inches. The available water capacity is high, and permeability is moderate.

The Crosby Soil Series is characterized by a seven (7)-inch thick, grayish-brown silt loam surface layer and a grayish-brown and brown, mottled clay loam subsoil to a depth of twenty-nine (29) inches. The available water capacity is high, permeability is slow, and the water table is seasonally high.

The Genesee Soil Series is characterized by a nine (9)-inch thick dark-brown silt loam surface layer and brown silt loam subsoil to a depth of thirty-five (35) inches. The available water capacity is high, permeability is moderate, and run off is slow.

The unconsolidated sediments are glacial and glaciofluvial in origin and one hundred fifty (150)- to two hundred (200)-feet thick. The surficial deposits consist of Wisconsinan Age ground moraine and Holocene Age alluvium.

Subsurface unconsolidated deposits have been identified as glacial till containing discontinuous intertill lenses of sand, gravel and silty sands of varying thicknesses at varying depths. The highest concentration of near surface sand and gravel lenses are present immediately west and southwest of the landfill. They range in thickness from four (4) to twenty-four (24) feet at an elevation of 850 to 875. The top of this saturated sand and gravel lens ranges in depth from ten (10) to fifteen (15) feet below ground surface and provides a pathway for potential contamination from the landfill and the adjacent former ECC site, to Finley Creek. Shallow saturated sand and gravel lenses have been identified to the north, east and south limits of the landfill, but have not proved to be laterally extensive.

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A deeper, confined saturated sand and gravel aquifer has been identified near the east, west and south limits of the landfill. The top of these saturated units are found at a depth of twenty-five (25) or more feet below ground surface. The lateral extent of this aquifer has not been completely identified, but it exhibits an upward gradient, seen by the presense of flowing wells located at the east, south and west limits of the landfill. Contamination of this aquifer is unlikely due to the apparent upward vertical gradient, except for potential dense, non-aqueous phase liquids (DNAPL), which were disposed of in the landfill. The following is a list of hazardous wastes that were documented as being disposed of in NSLF, some of which may contain DNAPL characteristics:

Paint wastes and filters from various processes Waste tar materials Sulphuric acid Oily wastes Hemoglobin diagnostic kits Acid waste (various types) Empty drums (roofing sealants) Still bottom sludge from solvents Oil and wastewater Incinerator ash Casting, grinding sludge Microbioligical treatment sludge Methylene chloride, polyurethane Glue, ink sludge, setup rubber waste Neoprene latex Polyvinyl acetate adhesive Grease trap wastes Oil soaked sand/straw/soil Resin solvents Spill residual Roadside dump barrels Lead contaminated ash Methylene chloride waste Waste sludge from recovery of halogenated solvents Neoprene latex, polyvinyl acetate solvents Waste treatment sludge KO52 Centrifuge sludge F006 Cetric acid, urea hydrofluoric acid Salt bath brazing furnace waste Cadmium plating waste Industrial waste treatment sludge Hard rubber/PVC battery cases Still bottoms/solvent recovery waste Plastic scrap film Sand containing ethyl hexyl acrylat Ink filters, detergent residue Polymerized styrene monomer Paint stain

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The preceeding list includes several different hazardous waste constituents which could show up in ground water at the top, middle, or lower portion of an aquifer or be transported by advection flow. The DNAPL contaminants (with specific gravity greater than water) could migrate against the upward gradient of ground water flow in the lower confined unit.

The deeper soil borings indicate a lesser number of sand and gravel lenses exist below the 850 elevation. This material consists of glacial till with occasional small lenses of sand and gravel. Near the base of this till unit lies a sand and gravel aquifer ranging in thickness from two (2) to fifteen (15) feet. This is at a depth of one hundred fifty (150) to two hundred (200) feet below ground surface. The physical thickness of the overlying till coupled with the upward gradient of the confined aquifer unit diminish the potential for this lower aquifer from becoming contaminated.

The bedrock beneath the site was encountered in at least one (1) boring on-site at a depth of one hundred sixty-one (161) feet. It was described as a white to gray unweathered, hard limestone, probably of the North Vernon Formation of Devonian Age. It is of little importance as a productive aquifer in the immediate area of the landfill, although it may be a productive aquifer elsewhere. The bedrock is not a monitored unit and the thickness of the glacial till and flow characteristics of the overlying units should preclude it from becoming contaminated from an onsite source.

There are two saturated zones which require monitoring. The first is the uppermost saturated unit which consists of an unconfined saturated till which discharges into saturated sand and gravel lenses--most of which are located on the southwest perimeter of the landfill. Static water level measurements from wells screened in this unconfined unit (less than twenty-five (25) feet in depth), indicate ground water flow predominately from northeast to southwest toward the confluence of Finley Creek and Unnamed Ditch. The amount of ground water discharged into Finley Creek and Unnamed Ditch is unknown; however, several ground water "seeps" have been identified on the channel wall of Finley Creek downstream of the confluence with Unnamed Ditch during low flow conditions. The second saturated zone requiring ground water monitoring is at a depth of twenty-five (25) to forty (40) feet below the ground surface. It is under confining conditions and maintains a higher potentiometric surface than the unconfined unit, indicating an upward vertical gradient for ground water flow. The direction of ground water flow for the confined unit is from northeast to southwest toward the confluence of Finley Creek and Unnamed Ditch. Discharge of ground water from this unit into Finley Creek or Unnamed Ditch adjacent to the landfill is unlikely due to the minimal effect its upward gradient has on water levels in the upper unconfined unit. However, discharge of ground water from this zone could enter either Finley or Eagle Creek near their confluence. Monitoring of the confined unit is considered necessary due to the lack of an identified recharge area, and the uncertainty of hydraulic interconnection between the confined and the unconfined units.

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Well System Evaluation

The monitoring system for the landfill consists of seven (7) wells for RCRA Monitoring, although only four (4) of these wells are sampled for RCRA parameters by the facility. These include MW-6 (upgradient well), MW-3, -4, and -5 (downgradient). Monitoring wells MW-1, 2, and 7 are sampled by the facility as solid waste wells. All seven well casings and screens are constructed of PVC which can absorb certain organic constituents and affect sampling results. It is unknown whether glue was used on casing joints. A filter pack was not used for any of the well screens. The natural sand and gravel was allowed to collapse around the well screen. As a result, the monitoring wells tend to "silt in" causing a reduction in effective screen length. Ground water samples tend to become increasingly turbid as sampling progresses. The one (1)-foot thick bentonite annular seal above the well screens are insufficient to insure that ground water samples are collected from a discrete zone within the aquifer. Also, the one (1)-foot thick bentonite surface seals are insufficient to prevent surface drainage from entering the annular space and affecting the quality of the ground water samples. The depth of the cement surface seals are unknown. They may not extend below the annual freeze line of the soil, which can lead to "frost heaving" of the seals thus allowing surface water runoff to enter the annular space and potentially affect the quality of the ground water samples.

The size of the landfill is too large and the subsurface geology too complex for seven (7) wells to adequately monitor the site for potential contamination. A series of nested monitoring wells need to be added to the present RCRA monitoring system to adequately monitor the site for potential contamination and to define the plume of contamination of ground water, that now exists at the southwest corner of the landfill.

A U.S. EPA contractor has installed seventeen monitoring wells as part of a remedial investigation of the landfill by CERCLA. Many of these wells, along with a few additional new wells should be added to the RCRA monitoring system to adequately monitor the site.

Findings

The Findings from this inspection and an Ertech Inspection conducted by Ms. Rita R. Boje June 26, 1985, have been combined as a result of the landfill's failure to correct deficiencies in their ground water monitoring program since the last inspection.

1. The facility monitors as if in a detection ground water monitoring program (i.e., semi-annually for indicator parameters and annually for water quality parameters). The State contends that they have never adequately implemented a ground water assessment program and should therefore still be in Assessment Phase Monitoring.

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- 2. The facility continues to monitor only four of the seven wells for RCRA since they contend that only the East Field accepted hazardous waste (i.e., wells Nos. 3 through 6/RCRA--Wells Nos. 1, 2, and 7 NSLF). The State contends that since definite boundaries of hazardous waste disposal cannot be made, the entire site must be considered as the RCRA Hazardous Waste Management Unit and therefore, all wells (1 through 7) must be monitored as RCRA wells.
- 3. Annual reports have been submitted in an untimely manner (after March 1 of each year since 1982) and even though efforts were made to statistically compare the results, they were not done properly due to inadequate collection of indicator parameter data. Much of the required indicator parameter information are either incomplete or missing for each sampling event since NSLF began sampling as an interim status facility in 1982. The following details the inadequacies in their sampling for indicator parameters:
 - a. NSLF did not properly establish background for upgradient well MW-6. There were no replicates for any indicator parameters; no specific conductance (SC) for March 31, and July 15, 1982; no total organic carbon (TOC) for July 15, 1982; no total organic halogens (TOX) for March 31, and July 15, 1982.
 - b. NSLF did not report SC for downgradient wells MW-1, 2, 3, 4, and 5 from July 15, 1982 and September 30, 1982; and TOX for MW-1 and 2 from March 31, July 15, and September 30, 1982; and MW-3, 4, 5 from March 31, 1982 and July 15, 1982.
 - c. NSLF did not report results for the required U.S. EPA primary drinking water standards for March 31, July 15, and Sepember 30, 1982.
 - d. NSLF did not report replicates of indicator parameters for any samplings in 1983.
 - e. NSLF did not report replicates of indicator parameters for the downgradient wells for any sampling in 1984.
 - f. NSLF did not report replicates of indicator parameters for MW-1, 2, and 7 for 1985 and 1986.
 - 9. NSLF did not report replicates of indicator parameters for any wells in 1987.

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- 4. Further inadequacies of the monitoring system include the following: the wells (I through 7) did not have adequate annular seals; it is unknown whether glue was used to connect the joints of the PVC casings and screens; there is a major discrepancy between the well log depth and actual measured depth for W-7; and even if all seven (7) wells were used for RCRA, there are not enough wells downgradient of the site to adequately monitor the ground water. The entire aquifer thickness is not being monitored. Both the saturated unconfined till unit and the confined sand and gravel need to be monitored.
- The use of PVC casings and screens is not recommended due to its potential to react and degrade due to contact with certain organics.
- 6. NSLF did not submit an Annual Ground Water Report for 1986.

Items of concern during the inspection were as follows:

- 1. Under the ERTEC Appendix B, 10.0 Site Verification: 10.1.7.3, total depths for Wells Nos. 6, and 7 do not agree with the documented well log information (Well No. 6 is actually deeper than its well log indicates and Well No. 7 is actually shallower than the well log indicates).
- 2. Under Appendix C; 1.0 Background: 1.1, numerous organics and other constituents have been analyzed by several different state and governmental agencies and private laboratories. Upon a detailed review, common constituents showing up in or around monitoring Well No. 1 (IA, 1B, or IC, or in Unnamed Ditch surface water samples) in almost all of the analytical results are:
 - a. I, I-Dichloroethane
 - b. 1,2-Dichloroethane
 - c. Trans, 1,2-Dichloroethene
 - d. TCE
 - e. 1,1,1-Trichloroethane
 - f. Vinyl Chloride
 - g. Methylene Chloride

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Other consistingents that have not shown up consistently but have been detected in various laboratory analyses in the same area include:

- Benzene
- 2. Chloroethane
- 3. Toluene
- 4. 2,4-Dimethylphenol
- 5. Phenol
- 6. Bis (2-Ethylhexyl) phthalate
- 7. Bis (2-Chloroethyl) Ether
- 8. Tetrachloroethylene
- 9. 1,2-Dichlorobenzene
- 10. Diethyl phthalate
- 11. Dimethyl phthalate
- 12. Di-N-Butyl phthalate
- 13. Isophorone
- 14. PCB

Sampling Inspection Findings

A sampling inspection was conducted August 27, 1987, by Philip N. Ward of the IDEM. Others in attendance were Messrs. John Buck and Eric Henderson (IDEM); Greg Bankert (sampler for NSLF); and Tony Oatess (O. A. Laboratories --the analytical lab for NSLF). Mr. Bankert was responsible for well purging and sample collection, while Mr. Oatess was responsible for filling the sample containers and sample preservation. The findings of this inspection (listed below) are similar to the findings of a sampling inspection conducted by Ms. Rita R. Boje (IDEM) on July 3, 1985. Mr. Bankert and Mr. Oatess were generally careful at collecting samples; however, the following changes in the NSLF Sampling and Analysis Plan (SAP) are required to insure that samples are collected in a consistent manner and are representative of the ground water:

- The SAP requires major revision to reflect proper sampling procedures and equipment.
- The sampler(s) should have a copy of the SAP with them while sampling.

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- 3. The depth measuring device should not be weighted with an old metal key lock. They should use either a stainless steel weight or some sort of other water level recording device.
- Total depth of each well should be measured and recorded prior to purging.
- 5. The volume of water in the well should be calculated immediately prior to purging.
- 6. Volumes purged for each well and specified method used for purging and sampling should be noted on the "Well Sampling Field Record" sheets. This has not been done in the past and should, henceforth, be recorded.
- 7. Purging of wells should be done immediately prior to sampling. Slow recovery wells should be sampled within two (2) hours of purging.
- 8. The upgradient wells (MW-6 and 7) should always be sampled first.
- 9. The bailer should be constructed of an inert material instead of the PVC bailer now being used. The nylon rope which has the potential of contacting the water within the well, should be replaced by stainless steel cable or a stainless steel leader with polypropylene rope.
- 10. The bailer and rope were not properly decontaminated between wells. Purging/sampling equipment (including the rope) should be decontaminated with distilled water with at least three (3) thorough rinses.
- 11. The samples collected for metals analysis were not filtered or preserved in the field immediately following sampling.
- 12. Sample containers did not have proper labels. They should have the well number, time and date, parameter, and type or preservative clearly displayed on the sample container.
- 13. The samples tested for pH, specific conductance (SC) were not field determined. Samples should be tested for pH, SC, and temperature should be determined at the well head during sampling.
- 14. Field, trip, and/or equipment blanks should be utilized for quality control purposes.
- 15. Duplicate samples should be utilized for quality control purposes.
- 16. Protective equipment, such as gloves, should be utilized for prevention of personal contact with contaminated ground water.

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Conclusion and Recommendation

These violations result in the failure of the facility to have and maintain a ground water monitoring program that is capable or determining the facility's impact on the quality of ground water in the uppermost aquifer underlying the facility.

In order to come into compliance with state and federal regulations, NSLF needs to install a new monitoring well system consisting of many properly placed chemically inert, nested monitoring wells, Installation, sampling and analysis of this monitoring system should follow methods proposed by the the U.S. EPA RCRA Technical Enforcement Guidance Document.

An enforcement referral is not being generated as result of this inspection, due to the existing complaint against NSLF following a CME and sampling inspection conducted by Ms. Boje on June 26, and July 3, 1985, respectively.

PNW/tjd

cc: Mr. Bernie Orenstein, U.S. EPA Region V Mr. Dennis Zawodni

Ward

Northside Landfill RCRA Groundwater File IND 050530872

Karyl K. Schmidt

Philip N. Ward

455-14-88

4717K

Geology Section

Comprehensive Monitoring Evaluation and Sampling Inspection Conducted (July 23, 1987,) and Related Reviews

August 26, 198

Introduction

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EPA received a Part A application for a hazardous waste permit at NSLF.

June 27, 1981--

ISBH Consent Decree. NSLF took
hazardous waste from ECC onto the NSLF
property (February 1980-August 1980)
and ECC midnight dumping into Finley
Creek (August 1979-August 1980).

July 22, 1982--

ISBH suspended action on the review of the NSLF hazardous waste application due to documented groundwater contamination in one or more of the

wells and required that NSLF implement a groundwater assessment program. $\stackrel{-}{\Lambda}$

August 4, 1982--

An assessment plan was submitted by T. R. West for NSLF with a schedule of implementation.

August 1982--

ECC went into receivership (found to be insolvent).

October 22, 1982--

T. R. West submitted an assessment report and contended contamination in Well IC was from ECC and not NSLF.

January 5, 1983--

ISBH reviewed T. R. West's assessment report and it was found to be incomplete.

January 31, 1983--

T. R. West responded to the January 5, 1983, ISBH letter--found to still be incomplete.

May 4, 1983--

A The NOV and the Compliance Order sent to NSLF with violations related mainly to an inadequate assessment program.

May 23, 1983--

Again, T. R. West further responded to the January 5, 1983, letter. May 1983

An administrative hearing was held and more groundwater quality information what has been generated. NSLF has (since March of 1983) reinstated a detection phase of groundwater monitoring around the East Field only of the landfill since they contend that the East Field was the only area that accepted hazardous waste from ECC. DEM contends that the whole site needs to be monitored for RCRA and should still be in an assessment phase.

TYPIST: INSERT PP. SA-SE HERE

Regional Geology

The facility is located in the Tipton Till Plan. The surface is a flat to gently rolling area formed on ground moraine glacial till deposited during the Wisconsin Glacial Advance. Soils are the Miami, Crosby and Genesee silt loams, according to the Soil Survey of Boone Company. Indiana by the U.S.D.a. Soil Conservation Service. The Miami-Crosby Association consists of nearly level to moderately steep soils that formed in glacial till. The genesse series consists of deep, well-drained, nearly level soils formed on alluvial deposits.

The bedrock beneath the site is the carbonaceous New Albany Shale of Devonian-Mississippian Age, according to the geologic map of the 1°x2°, Danville Quadrangle, Indiana and Illinois, showing bedrock and unconsolidated

TYPIST: INSERT AFTER AN ADMIN 5A

May 19, 1983

Terry West to Traylor (LPC) - further response to January 5, 1983

JAN/05/83 letter:

- 1. Table of groundwater data
- 2. groundwater flow map groundwater mound at S4.
- 3. geologic log of MW-1C
- 4. cross-sections
- 5. ATEC boring logs

June 17, 1983

OA Lab monitoring well no. 1+C - compares amounts of victorinated hydrocarbons in MW-1C with an Indianapolis July 20, 1983

water supply well - (reported JUL/20/83)

July 22, 1983 LPC monitoring well sample - collected by Bernaur and November 9, 1983

Copeland - (reported NOV/09/83)

September 28, 1983 OA Lab monitoring well samples - groundwater quality - October 4,1983

(reported OCT/06/83)

October 18, 1983 Ball State Study - Less benthic and lower total number of organisms downstream from the Northside Sanitary

Ldfl. (Gary Hook for Dr. H. Stewart).

October 19, 1983 Operating permit (No. 6-1) renewal application denied:

- 1. deviation from approved plan
 - a. failure to pump leachate tanks
 - b. plugging southern leachate line
 - c. removal of solid waste from previously filled area
- 2. discharging contaminated

 ★
 groundwater into unnamed ditch ✓
- acceptance of hazardous waste without approval
- 4. contamination of groundwater

 near MW-1
- therefore ordered to close.

November 09, 1982 West response to NOV allegations

November 15, 1983 Freeman Cook commissioned by LPC to prepare an independent engineering report (Environmental Compatibility Review).

December 15, 1983

December 15, 1983 Indianapolis Water Company (12/15/83) detected

organics in sampling Finley and Eagle Creeks.

December 7,1983

Chemical Waste Management had small spill (12/7/83)
becamber 16,1983

Downey (LPC) sampled ditch for organics (12/16/83) and

December 30,1983

Finley Creek and Eagle Creek (12/20/83).

December 16, 1983 LPC ditch and stream samples - collected by Downey

January 9, 1484

(LPC) - (reported JAN/09/84)

December 20, 1983 LPC ditch and stream samples for organics - collected January 9,1984 by Downey (LPC) - (reported JAN/09784)

January 17, 1984 Letter Lamm (LPC) to Gole (DPW) - informed about results of organic contamination sampling.

Pebruary 15, 1984 LPC surface water samples - collected by Shafer and

Downey (LPC) - from unnamed ditch, Finley Creek, and

February 2, 1984

Eagle Creek - (reported FEB/02/84)

February 29, 1984 CH₂M water samples from residential wells - accuracy suspect

March 5, 1984 Letter Doyle (LPC) to Bankert (NSL) - still questions

A

about

- 1. leachate system
- 2. final elevations
- closure sequence
- 4. closure lifetime
- 5. remedial groundwater cleanup

 can't act on sludge matter until Consent Decree

 addresses these problems.

March 15, 1984

Hunt - "I believe testimony is going to reveal nature and extent of illegal activity at NSL - entering into
a Consent Decree prematurely will only hide these violations.

March 16, 1984

Affidavit of Karyl Schmidt (LPC) - samples from cooling pond, unnamed ditch, and unnamed tributary.

March 21, 1984

 ${
m CH_2M}$ Hill - surface water and sediment samples.

March 30, 1984

OA Lab monitoring well samples - indicators of April 27,(98) groundwater quality - (reported APR/27/84)

May 7, 1984

Environmental compatibility review final report - Freeman Cook.

May 30, 1984

Zionsville Times article - from hearing - TCE in MW-1 should be 1000 x's greater due to calibration error in lab.

June 22, 1984

Review of work plan - no geology review.

August, 1984

EPA Superfund program fact sheet

October 12, 1984

EPA denied Part B.

MARCH 6,1985 NSLF SUBM. TIRD PARALYTICAL

TRESULTS FOR MOR. TORING WALL

NO. 10 TREPORTED CONCENTRITIONS

FOR THE FOLLOWING CONSTITUENTS:

BENTENE AT 2.6 Mg/L,

CHROSURTHANE AT 177.1 Mg/L,

AND 1,2-t-DICHLOSOFTHANE

AT LESS THAN 7.9 Mg/L.

APRIL 16, 1985 NSCF SUBMITTED A SAMPLING AND ANALYSIS PLAN TO IDEM.

JUNE 10, 1985 LATTER FROM C/O NSLF TO

JEM, STATENG THAT THEY

NO ZONGER INTEND TO SAMPLE

WELLS NO. 3,4,5, AND 6 FOR

CONVENTIONAL PARAMETERS.

TONE 21, 1985 LEFTER FROM JOEM TO

O/O NSEF CONCERNING THE

FACILITY'S GW SAMPLING PROGRAM

JUNE 26, 1985 LETTER FROM CLO NSCF TE IN RESPONSE TO THE TOWEZINGS REITERATES THEIR CONTENTION THAT WELLS 1, Z, AND ? ARE NOT RERA GW MOUTERING

June 26, 1985

Comprehensive Ground-Water Monitoring Inspections by Rita R. Boje

July 3, 1985 Trans 9,1987

Sampling Inspection by Rita R. Boje DISCUSSION OF PERSONS OF GW AND SAMPLING INSPACTION CONSULTED BY RITH R. BOSE OF IDEM ON JUNE 26, 1985

AND JULY 3, 1985 OPESPECTIVELY.

FEBRUARY 9, 1987 I DEM GEQUESTED THAT NSEF CLOSING / POST-CLOSULE ER PURSUANT TO CERCLA ACTIOITIES.

HOWEVER THE ONE () ONE ITE BORING TO BEBROCK, INDICATES
THE NORTH VEENON LIMESTONE WAS ENCOUNTERED DIRECTLY BENEATH
deposits. The bedrock dips southwestward into the Illinois basin.

MATERIAL.

The major regional aquifer in this area consists of glacial outwash sand and gravel lenses within the till. Well screen depths in the vicinity of the landfill range in depth from forty (40) to one-hundred ninety (190) feet. Wells in the vicinity of the landfill are used for domestic purposes and pump rates are on average less than ten (10) gallon per minute (GPM) and is not likely to affect flow direction. The regional GW flow direction is to the southwest toward the confluence of finley and Eagle Creeks.

Site Specific Geology

The site's orginal land surface is a flat to gently rolling till plain sloping toward the confluence of Finley and Eagle Creeks. P_{RE} -landfill elevations ranged from 880 to 940 feet above the National G_{EODET} . Vertical Datum (NGVD).

Original Soils prior to landfilling include the Miami-Crosby Soil
Association. According to the Soil Survey of Boon County, Indiana by the
U.S.D.A. Soil Conservation Service, these are deep, well-drained and somewhat
poorly drained, medium-textured and moderately fine textured, nearly level to
moderately steep soils formed in glacial till on uplands. The area
immediately to the west and south of the landfill is represented by the
Genesee Soil Series. This consists of deep well-drained, nearly level soils
on bottom lands. These soils formed in loamy sediment disposited by floods.

The Miami Soil Series is characterized by an eight inch thick grayish-brown silt loam at the surface and a dark to yellowish-brown clay loam subsoil to a

depth of thirty-three (33) inches. the available water capacity is high, and permeability is moderate.

The Crosby Soil Series is characterized by a seven (7) inch thick,
grayish-brown silt loam surface layer and a grayish-brown and brown, mottled
clay loam subsoil to a depth of twenty-nine (29) inches. The available water
capacity is high, permeability is slow, and the water table is seasonally high.

the Genesse Soil Series is characterized by a nine inch thick dark-brown silt loam surface layer and brown silt loam subsoil to a depth of thirty-five (35) inches. The available water capacity is high, permeability is moderate, and run off is slow.

The unconsolidated sediments are glacial and glaciofluvial in origin and one hundred fifty (150) to two hundred (200) feet thick. The surfacial deposits consist of Wisconsin Age Ground Moraine and Holocene Age Alluvium.

Subsurface unconsolidated deposits have been identified as glacial till containing discontinuous intertill lenses of sand, gravel and silty sands of varying thicknesses at varying depths. The highest concentration of near surface sand and gravel lenses are present immediately west and southwest of the landfill. They range in thickness from four (4) to twenty-four (24) feet at an elevation of 850 to 875. The top of this saturated sand and gravel lense ranges in depth from ten (10) to fifteen (15) feet below ground surface and provides a pathway for potential contamination from the landfill and the adjacent former ECC site, to Finley Creek. Shallow saturated sand and gravel lenses have been identified to the north, east and south limits to the landfill, but have not proved to be laterally extensive.

A deeper, confined saturated sand and gravel aquifer has been identified near the east, west and south limits of the landfill. The top of these saturated units are found at a depth of twenty-five (25) or more feet below ground surface. The lateral extent of this aquifer has not been completely identified, but it exhibits an upward gradient, seen by the presense of flowing wells located at the east, south and west limits of the landfill.

Contamination of this aquifer is unlikely due to the apparent upward gradient, except for potential sinking organic contaminants, which were disposed of in the landfill. The following is a list of hazardous wastes that were documented as being disposed of in VSLF/ - some of which may contain DNAPL characteristics.

Paint wastes and filters from various processes Waste tar materials Sulphuric acid Oily wastes Hemoglobin diagnostic kits Acid waste (various types) Empty drums (roofing sealants) Still bottom sludge from solvents Oil and wastewater Incinerator ash Casting, grinding sludge Microbioligical treatment sludge Methylene chloride, polyurethane Glue, ink sludge, setup rubber waste Neoprene latex Polyvinyl acetate adhesive

Grease trap wastes

Oil soaked sand/straw/soil

Resin solvents

Spill residual

Roadside dump barrels

Lead contaminated ash

Methylene chloride waste

Waste sludge from recovery of halogenated solvents

Neoprene latex, polyvinyl acetate solvents

Waste treatment sludge KO52

Centrifuge sludge F006

Cetric acid, urea hydrofluoric acid

Salt bath brazing furnace waste

Cadmium plating waste

Industrial waste treatment sludge

Hard rubber/PVC battery cases

Still bottoms/solvent recovery waste

Plastic scrap film

Sand containing ethyl hexyl acrylat

Ink filters, detergent residue

Polymerized styrene monomer

Paint stain

The preceeding list includes several different hazardous waste constituents

Ground water

which could show up in GW samples at the top, middle, or lower portion of an

aquifer as "floaters," "sinkers," or be transport by ADVECTION flow. The DNAPL

sinking contaminants with specific gravity greater than water could move migrate against the upward gradient of ground-water flow in the lower shallow aquifer.

The deeper soil borings indicate a lesser number of sand and gravel lenses exist below the 850 elevation. This material consists of glacial till with occasional small lenses of sand and gravel. Near the base of this till unit lies a sand and gravel aquifer ranging in thickness from two (2) to fifteen (15) feet. This is at a depth of one-hundred and fifty (150) to two hundred (200) feet below ground surface. The physical thickness of the overlying till coupled with the upward gradient, the second uppermost aquifer diminish the potential for this lower aquifer from becoming contaminated.

The bedrock beneath the site was encountered in at least one (1) boring onsight at a depth of one hundred sixty-one (161) feet. It was described as a white to gray unweathered, hard limestone, probably of the North Vernon Formation of Devonian Age. It is of little importance as a productive aquifer in the immediate area of the landfill, although it may be a productive aquifer elsewhere. The bedrock is not a monitored unit and the thickness of the glacial till and flow characteristics of the overlying units should preclude

Continued next page

it from becoming contaminated from an onsite source.

There are to saturated zones which require monitoring. The first is the upper most saturated unit which consists of an unconfined saturated till which descharges into saturated sand and gravel lenses, Most of which are located on the southwest perimeter of the landfill. Static water level measurements from shallow wells less than twenty-five (25) feet in depth, indicate GW flow predominately from northeast to southwest toward to confluence of Final Creek and Unamed Ditch. The amount of ground water discharged into Finley Creek and Unamed Ditch is unknown (However, several ground-water "seeps" have been DOUNSTREAM OF THE CONFEVENCE WITH UNAMED identified on the channel wall of Finley Creek during low flow conditions. The second saturated zone requiring GW monitoring is at a depth of twpety-five (25) to forty (40) feet below the ground surface. It is under confining conditions and maintains appotentiometric surface(higher) than for UNCONFINED DNIT ne, indicating an upward gradient for GW flow within the second shallow staurated zone (SSSZ). The direction of GW flow for the SSST is from northeast to southwest toward the confluence of Finley Creek Discharge of GW fron the SSSZ into Finley Creek or Unamed Ditch adjacent to the landfill is unlikely due to the minimal effect its upper unconfined units upward graident has on water levels in the first shallow saturated zone However, discharge of GW from this zone could enter either Finley or confined unit Eagle Creek near their confluence. Monitoring of the isynecessary due to the uncertainty of hydraulic it is unknown if a the lack of an identied recharge area and it exists between the \$557 and the Fotential unconfined units sinkers.

Well System Evaluation

The monitoring system for the landfill consists of seven (7) wells for RCRA Monitoring, Although, only four (4) of these wells are sampled for RCRA parameters by the facility. These include MW-6 (upgradient well), MW-3,-4 and -5. Monitoring wells MW-1,2, and 7 are sampled as solid waste wells. All seven well casing and screens are constructed of PVC which can absorb certain organic constituents and affect sampling results. It is unknown whether glue was used on casing joints. A filter pack was not used for any of the well The natural sand and gravel was allowed to collapse around the well As result, the monitoring wells tend to "silt in" causing a reduction in effective screen lenght. Ground-water samples tend to ecome increasingly turbid as sampling progresses. The one (1) foot thick bentonite annular seal above the well screens are insufficient to insure that ground-water samples collected Zone within the aquifer. are from a discrete location. Also, the one (1) foot thick bentonite surface seals are insufficient to prevent surface drainage from entering the annular space and affecting to quality of the ground-water samples. The depth of the cement surface seals are unknown. They may not extend below the annual freeze " frost heaving" thung allowing surface line of the soil, which can lead to failure of the seals to prvent surface water runoff from entering the annular space and affecting the quality of the ground-water samples.

The subsurface geology is too complex for seven (7) wells to adequately monitor the site for potential contamination. A series of nested monitoring wells need to be added to the present RCRA monitoring system to adequately monitor the site for potential contamination and to define the plume of contamination of GW, that now exists at the southwest coentry of landfill.

An EPA contractor has installed seventeen monitoring wells as part of a remedial investigation of the landfill by CERCLA. Many of these wells, along with a few additional new wells should be added to the RCRA monitoring system to adequately monitor the site.

close up spall

Findings

The Findings from this inspection and an Ertech Inspection conducted by Rita R. Boje June 26, 1985, have been combined as result of the landfill's failure to correct deficiencies in their ground-water monitoring program since the last inspection.

- 1. The facility monitors as if in a detection ground water monitoring program (i.e., semi-annually for indicator parameters and annually for water quality parameters). The State contends that they have never adequately implemented a groundwater assessment program and should therefore still be in Assessment Phase Monitoring.
- 2. The facility only monitors four of the seven wells for RCRA since they contend that only the East Field accepted hazardous waste (i.e., Wells Nos. 3 through 6/RCRA Wells Nos. 1, 2, and 7/NSLF). The State contends that since definite boundaries of hazardous waste disposal cannot be made, the entire site must be considered as the RCRA Hazardous Waste Management Unit and therefore, all wells (1-7) must be monitored as RCRA wells.
- 3. Annual reports have been submitted in an untimely manner (after March I of each year since 1982) and even though efforts were made to statistically compare the results, they were not done properly due to inadequate collection of indicator parameter data. Much of the required indicator parameter information are either incomplete or missing for each sampling event since NSLF began sampling as an

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rinterim status facility in 1982. The following details the inadequacies in their sampling for indicator parameters:

- A. NSLF did not properly establish background for upgradient well MW-6. There were no replicates for any indicator parameters; no specific conductance (SC) for March 31, 1982, and July 15, 1982; no total organic carbon (TOC) for July 15, 1982; no total organic halogens (TOX) for March 31, 1982 and July 15, 1982.
- B. NSLF did not report SC for down gradient wells MW-1, 2, 3, 4, and 5 from July 15, 1982 and September 30, 1982; and TOX for MW-1 and 2 from March 31, 1982, July 15, 1982 and September 30, 1982 and MW-3, 4, 5 from March 31, 1982 and July 15, 1982.
- C. NSLF did not report results for the required EPA primary drinking water standards for March 31, 1982, July 15, 1982 and Sepember 30, 1982.
- D. NSLF did not report replicates of indicator parameters for any samplings in 1983.
- E. NSLF did not report replicates of indicator parameters for the downgradient wells for any sampling in 1984.
- F. NSLF did not report replicators of indicator parameters for MW-1, 2, and 7 for 1985 and 1986.

- G. NSLF did not report replicates of indicator parameters for any wells in 1987.
- 4. Further inadequacies of the monitoring system include the the wells (1-7) did not have adequate annular seals; it is unknown whether glue was used to connect the joints of the PVC casings and screens; there is a major discrepancy between the well long depth and actual measured depth for W-7; even if all seven wells were used for RCRA, there are not enough wells downgradient of the site to adequately monitor the groundwater. Some wells do not monitor the entire aquifer thickness, is not being monitored. Both the saturated was unafficed till unit and the confined sand and gravel need to be monitored.
- 5. The use of PVC casings and screens is not recommended due to its potential to react with and degradedue to contact with volatile certain organics.
- 6. NSLF DID NOT SUBMIT AN ANNUAL REPORT FOR 1986. V

 Items of concern during the inspection were as follows:
- 1. Under the ERTEC Appendix B, 10.0 Site Verification: 10.1.7.3, total depths for Wells Nos. 6, and 7 do not agree with the documented well log information (Well No. 6 is acutally deeper than its well log indicates and Well No. 7 is acutally shallower than the well log indicates).
- 2. Under Appendix C; 1.0 Background: 1.1, numerous organics and other constituents have been analyzed for by serveral different state and governmental agencies and private laboratories. Upon a detailed

No. 1 (1A, 1B, or 1C, or in unfamed ditch surface water samples) in almost all fo the analytical results are:

- 1. I, I-Dichloroethane
- 2. 1,2-Dichloroethane
- 3. Trans, 1,2-Dichloroethene
- 4. TCE
- 5. 1,1,1-Trichloroethane
- 6. Vinyl Chloride
- 7. Methylene Chloride

Other consistingents that have not shown up consistently but have been detected in various laboratory analyses in the same area include:

- 1. Benzene
- 2. Chloroethane
- 3. Toluene

- 4. 2,4-Dimethylphenol
- 5. Phenol
- 6. Bis (2-Ethylhexyl) phthalte
- 7. Bis (2-Chloroethyl) Ether
- 8. Tetrachloroethylene
- 9. 1,2-Dichlorobenzene
- 10. Diethyl phthalate
- 11. Dimethyl phthalate
- 12. Di-N-Butyl phthalate
- 13. Isophorone
- 14. PCB

Sampling Inspection Findings

A sampling inspection was conducted August 27, 1987, by Philip N. Ward of IDEM. On attedance were Messrs. John Buck and Eric Henderson of (IDEM) and Mr. Greg Banker (sampler for NSLF); and Mr. Tony Oatess of OA Laboratories the analytical lab for NSLF). Mr. Bankert was responsible for well purging and sample collection, while Mr. Oatess was responsible for filling the sample containers and sample preservation. The findings of this inspection (listed below) are similar to the findings of a sampling inspection conducted by Ms. Rita R. Boje or (IDEM) on July 3, 1985. Most changes in sampling procedures recommended by Ms. Boje in a post sampling inspection discussion with Mr. Bankert and Mr. Oatess were ignored for succeeding sampling events.

Mr. Bankert and Mr. Oatess were generally careful at collecting samples; however, the following changes in the NSLF Sampling and Analysis Plan (SAP) are required to insure that samples collected are representative of the ground water:

- The SAP requires major revision to reflect proper sampling procedures and equipment.
- The sampler(s) should have a copy of the SAP with them while sampling.
- 3. The depth measuring device should not be weighted with an old metal key lock. They should use eithr a stainless steel weight or some sort of other water level recording device.
- Total depth of each well should be measured and rechidded prior to Graphring.

- The volume of water in the well should be calculated immediately prior to purging.
- 6. Volumes purged for each well and specified method used for purging and sampling should be noted on the "Well Sampling Field Reocrd" sheets. This has not been done in the past and should, henceforth, be recorded.
- 7. Purging of well should be done immediately prior to sampling. Slow recovery wells should be sampled within two (2) hours of purging.
- 8. The upgradient wells (MW-6) should always be sampled first.
- 9. The bailer should be constructed of an inerst material instead of the

 PVC bailer now being used. The popel should be replaced by

 stainless steel cable or a stainless steel leader with polypropylene rope.
- 10. The bailer and rope was not properly decontaminiated between wells.

 Purging/sampling equipment (including the rope) should be

 decontaminated with distilled water with at least their thorough
 rinses.
- collected for wefels analysis

 1. The appropriate samples, were not filtered or preserved in the field

immediately following sampling.

12. Sample container did not have poper labels. They should have the well number, time and date, parameter, and type or preservative clearly displayed on the sample container.

nd

- 13. The samples tested for pH, specific conductance (SC) were not field determined. Samples should be tested for pH, SC, and temperature should be determined at the well head during sampling.
- 14. FIELD, TRIP, AND/OR EQUIPMENT BLANKS SHOVED BE UTILIZED FOR QUALITY CONTROL PURPOSES.
- 15. DUPLICATE SAMPLES SHOULD BE UTILIZED FOR V

 QUALITY CONTROL PURPOSES
- 16. PROTECTIVE EQUIPMENT, SUCH AS GLOURS, SHOULD DE BE UTILIZED FOR PREVENTION OF PERSONAL CONTACT WITH SEE CONTACT ON GW.

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Conclusion and Recommendation

NSLF has continued to ignore and/or fight past noted violations. These violations result in the failure of the facility to have and maintain a ground—water monitoring program that is cappable or determining the facility's impact on the quality of ground water in the uppermost aquifer uderlying the facility.

In order to come into compliance with state and federal regulations, NSLF needs to install a new monitoring well system consisting of many properly placed chemically inert, nested monitoring wells, Installation, sampling and analysis of this monitoring system should follow methods proposed by the EPA RCRA technical Enforcement Guidance Document.

An enforcement referral is not being generated as result of this inspection, due to the existing complaint against NSLF following a CME and sampling inspection conducted by Rita R. Boss on June 26, 1985, and July 3, 1985 respectively.

cc: Bernie Orenstein, U.S. EPA Region V CC: John Hayworth Denmis Zawodni

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